



Lead

Lead is a soft, dense, blue-gray metal. Lead occurs naturally in the earth's crust, where it combines with other elements such as oxygen and sulfur. It is used to make batteries and metal mixtures. Lead is also contained in some ammunitions, old pipes and their soldered connections, automotive radiators, pewter, pottery, folk medicines, leaded crystal glass, and as a contaminant in trace amounts in many products. Because of health concerns, lead is no longer added to gasoline and house paints. Lead solder for sealing tin food cans has been eliminated in the United States.

How People Are Exposed to Lead

People can be exposed to small amounts of lead by breathing air, drinking water, eating food, or swallowing dust or dirt that contains lead. For adults, the diet is the source of most general low-level environmental exposure to lead. Children can be exposed to more lead than adults. Children are commonly exposed to lead from hand-to-mouth activities involving contaminated dust and soils around older homes that contain lead-based paint or from eating paint chips that contain lead. Less common sources of lead exposure include folk medicines, cosmetics, ceramic and metal cookware, unusual clay-eating behaviors, and imported toys. Workers may be exposed in industries that involve lead, such as smelting and battery manufacturing. Workers can also secondarily expose household members by bringing lead home on their clothes.

How Lead Affects People's Health

No safe blood lead level has been identified. For infants and young children, lead levels of 10 micrograms or more in a deciliter of blood are levels of concern and can damage ability to learn. (A microgram is one millionth of a gram. A deciliter is about half a cup of liquid.) Of all people, young children face the most danger from exposure to lead because their growing bodies are more prone to harm and also children absorb lead more easily than do adults' bodies. Pregnant women and women of childbearing age should avoid exposure to lead because lead ingested by a mother can affect the unborn child.

At much higher blood lead levels lead can damage people's kidneys, blood, and nervous system and progress to coma, convulsions, or death.

Levels of Lead in the U.S. Population

In the *Fourth National Report on Human Exposure to Environmental Chemicals (Fourth Report)*, CDC scientists measured lead in the blood of 8,373 participants aged one year and older and in the urine of 2543 participants aged six years and older who took part in the National Health and Nutrition Examination Survey (NHANES) during 2003–2004. Prior survey periods of 1999–2000 and 2001–2002 are also included in the *Fourth Report*. By measuring lead in blood and urine, scientists can estimate the amounts of lead that has entered people's bodies.

- During the period of 1999–2004, 1.4% of children aged 1 to 5 years had blood lead levels of concern—i.e., 10 micrograms per deciliter or higher. This finding is lower than the 4.4% seen in the period of 1988–1994.
- This finding shows that public health efforts to reduce the number of children with elevated blood lead levels in the general population continue to be successful. However, special populations of children at high risk for lead exposure (for example, children living in homes containing lead-based paint or lead-contaminated dust) have higher rates of elevated blood lead levels and lead remains a major public health concern.

Biomonitoring studies on levels of lead provide physicians and public health officials with reference values so that they can determine whether people have been exposed to higher levels of lead than are found in the general population. Biomonitoring data can also help scientists plan and conduct research on exposure and health effects.

For More Information

- Agency for Toxic Substances and Disease Registry
Toxic Substances Portal—Lead
<http://www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=22>
- Centers for Disease Control and Prevention
CDC Childhood Lead Poisoning Prevention Program
<http://www.cdc.gov/nceh/lead/>
- Environmental Protection Agency
Lead in Paint, Dust, and Soil
www.epa.gov/opptintr/lead
- Department of Housing and Urban Development
About Lead-Based Paint
<http://www.hud.gov/offices/lead/healthyhomes/lead.cfm>
- National Library of Medicine, National Institutes of Health
ToxTown—Lead
http://toxtown.nlm.nih.gov/text_version/chemicals.php?id=16

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